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EXAMINER
MOORE, WILLIAM W

ART UNIT	PAPER NUMBER
1652	12

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/908,988	Applicant(s) OLSON ET AL.	
	Examiner William W. Moore	Art Unit 1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 November 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-115* is/are pending in the application.

4a) Of the above claim(s) *7 and 36-115* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 5, 6, 8-16, and 18-35* is/are rejected.

7)☒ Claim(s) *4,15 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *8 & 10* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election **with** traverse in Paper No. 11, filed November 6, 2002, of Group I, claims 1-6 and 8-18 wherein the genus of nucleic acids elected have nucleic acid sequences encoding the murine MURF-1 polypeptide, including the species having the sequence of SEQ ID NO:1, is acknowledged. Applicant first traverses the requirement for restriction between Groups I and VII on the grounds that Paper No. 9 mailed August 29, 2002 stated no explanation for dividing the coding sequences of Group I from the non-coding oligonucleotides of Group VII. Applicant's argument is persuasive with respect to the genus of oligonucleotides within Applicant's elected coding sequence, SEQ ID NO:1, described by claims 19-35. This aspect of the restriction of record is hereby RESCINDED and claims 19-35 are examined herein together with claims 1-6 and 8-18 to the extent that claims 19-35 describe sequences comprising oligonucleotides within SEQ ID NO:1.

Applicant also traverses the requirement for restriction as between Groups I and VII and Group IV on the grounds that antisense constructs might share some "essential characteristic" with a coding segment of Group I or might be used concurrently with a product of Group I and. Thus the arguments actually address the restriction requirement between Groups IV and I. Neither is found persuasive because no essential characteristic is shared by products of Groups IV and I where a product of Group IV cannot encode a MURF-1 polypeptide, because no specific concurrent use is discussed in section III-C of the specification as alleged, and because "a serious burden on the examiner may be *prima facie* shown . . . by . . . separate classification", MPEP §803, and the restriction requirement, Paper No. 9 mailed August 29, 2002, stated separate classifications of the inventions of Groups IV and I and of Groups IV and VII. The restriction requirement between Groups IV and I and the restriction requirement between Groups I and VII and Groups II-VI and VIII-XLV are still deemed proper and are therefore made FINAL.

Specification

The disclosure is objected to because of the following informalities: Misspellings occur due to the presence of incomplete words in the text of the specification, see, e.g., page 3, line 21, where "provided" is the proper, complete, word, and page 29, line 18, where "Antisense" is the proper, complete, word. Appropriate correction is required; Applicant is also encouraged to review the specification for similar informalities.

Information Disclosure Statements

Applicant's two information disclosure statements (IDS), Papers Nos. 8 and 10 filed, respectively, July 18 and January 2, 2002, were assigned Paper Nos. according to the order of the entry in the file. Both information disclosure statements have been considered by the examiner.

Claim Rejections - 35 USC § 101

35 U.S.C. §101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-3, 5, 6, 8 and 9 are rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter.

None of claims 1-3, 5, 6, 8 or 9 describe statutory subject matter: A composition of matter made by a person. The recitation, "DNA segment encoding", does not describe a "new . . . composition of matter". Claim 1 instead describes a product of Nature which is a chromosome present within all of the nucleated cells of any mouse. Such a chromosome is a "DNA segment" comprising a nucleotide sequence that will encode a murine MURF-1 polypeptide. Claim 4 is not subject to this rejection because a transcript that has a DNA sequence of SEQ ID NO:1 must be a cDNA, a product made by a person. Claim 6 is included in this rejection because no promoter can be a native coding region - by definition promoters are apart from coding regions - thus the claim permits a native promoter in the chromosome apart from a coding region. Amending claim 1 to insert "isolated" before

"DNA segment" will overcome this rejection. Applicant is also encouraged to use care in choosing the proper indefinite article to begin the amended claim 1.

The elected subject matters of claims 1-6 and 8-35 are not otherwise rejected herein under 35 U.S.C. §101 herein because nucleic acids encoding a murine MURF-1product are embodiments of each of claims 1-6 and 8-18 have patentable utility, as do the embodiments of claims 19-35 which comprise oligonucleotides having an array of at least 15 contiguous nucleotides of SEQ ID NO:1. The murine MURF-1-encoding nucleic acid sequences, vectors, and host cells of claims 1-6 and 8-17, and the recombinant method of using a host cell for expression of the murine MURF-1 of claim 18, have a specific, substantial, and demonstrable utility in producing the MURF-1 polypeptide which, upon production, may be used as disclosed at pages 80-85 of the specification to stabilize cellular microtubules to form mature, stable, microtubules, and to stabilize intermediate filaments as well. Oligonucleotides of claims 19-35 comprising an array of at least 15 contiguous nucleotides of SEQ ID NO:1 have a specific, substantial, and credible utility in detecting either the presence of normal, full-length, MURF-1-encoding transcripts or the presence of truncated, or other aberrant, MURF-1transcripts in striated muscle tissue and its developmental precursors, as disclosed at pages 26-27 and 69-70 of the specification.

The elected subject matters of claims 2-4, 15, 17 and 19-30 are not rejected herein under the first paragraph of 35 U.S.C. §112 because nucleic acid segments having nucleic acid sequences encoding a murine MURF-1 polypeptide, and nucleic acids comprising oligonucleotides having an array of at least 15 contiguous nucleotides of SEQ ID NO:1, are adequately described by the specification such that artisans could recognize Applicant's possession of the claimed products at the time Applicant's priority application was filed and because the specification enables the preparation of the claimed products.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. §112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 5, 6, 8-14, 16, 18 and 31-35 are rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Other than nucleic acid segments having sequences encoding the murine MURF-2 and MURF-3 polypeptides, the specification fails to exemplify or describe the preparation of the subject matters of nucleic acid segments having nucleic acid sequences that encode polypeptides having amino acid sequences that differ from the elected MURF-1 sequence of SEQ ID NO:2. Each of the disclosed MURF-1, MURF-2, and MURF-3 polypeptides, and their encoding cDNA sequences, are of murine origin and by comparison with murine MURF-2 and MURF-3 coding sequences and encoded amino acid sequences, the artisan can recognize murine MURF-1 coding sequences, and encoded amino acid sequences, even though they comprise minor sequence variations.

Yet claim 1, from which claims 5, 6 and 8-11 depend, and claim 12, from which claims 13, 14 and 16 depend, claim 18, as well as claim 31, from which claims 32-35 depend, are - according to page 3, lines 22-24, of the specification - intended to describe nucleic acid segments that encode any divergent polypeptide from any conceivable source. The specification fails to describe where any differences in divergent amino acid sequences might occur and what the differences might be. The specification similarly fails to describe the "hybridizing" nucleic acid segments that encode such divergent, non-murine, MURF polypeptides. "While one does not need to have carried out one's invention before filing a patent application, one does need to be able to describe that invention with particularity" to satisfy the description requirement of the first paragraph of 35 U.S.C. §112. *Fiers v. Revel v. Sugano*, 25 USPQ2d 1601, 1605 (Fed. Cir. 1993). The specification furnishes no relevant identifying characteristics of nucleic acid segments encoding, in whole or in

part, non-murine MURFs diverging from the amino acid sequence of SEQ ID NO:2 at, e.g., as many as 50% of 296 of its amino acid positions - where as many nucleotide sequence differences in "hybridizing" DNAs occur in swing codon positions as in the initial two codon positions - or at as many as 66% of 296 of its 366 amino acid positions - where nucleotide sequence differences in "hybridizing" DNAs occur in initial codon positions. Neither does the specification teach characteristics that permit a correlation between the structures of isocoding, hybridizing, nucleic acid segments specifying the amino acid sequence of SEQ ID NO:2 and the structures of undisclosed, "hybridizing", nucleic acid segments that encode generic proteins.

The Court of Appeals for the Federal Circuit held that a claimed invention must be described with such "relevant identifying characteristic[s]" that the public could know that the inventor possessed the invention at the time an application for patent was filed, rather than by a mere "result that one might achieve if one had made that invention". *University of California v. Eli Lilly*, 119 F.3d 1559, 1568, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). Indeed, like the claims invalidated in *Lilly*, claims rejected herein were intended – see page 3, lines 22-24, of the specification – to embrace other, unknown, MURF-like proteins of humans, dogs, rats, rabbits, fruit flies, or yeast. Nothing demonstrates that Applicant was "able to envision" enough of the structure of an undisclosed nucleic acid segment encoding an undisclosed generic protein at the time the specification was filed to provide the public with identifying "characteristics [that] sufficiently distinguish it . . . from other materials". *Fiers*, 25 USPQ2d at 1604 (citing *Amgen, Inc. v. Chugai Pharmaceutical Co.*, 18 USPQ2d 1016, 1021 (Fed. Cir. 1991). The specification's treatment of subject matters of claims 1, 5, 6, 8-14, 16, 18 and 31-35 is entirely prospective where skilled artisans in the field of molecular biology could not predict the structure or other properties of nucleic acid segments that encode generic MURF proteins.

Claims 1, 5, 6, 8-14, 16, 18 and 31-35 are rejected under 35 U.S.C. §112, first paragraph, because the specification is not enabling for any embodiment of nucleic acid

segment having an coding sequence that diverges from a nucleic acid sequence encoding a murine MURF-1 protein, where such a protein may diverge from the amino acid sequence of SEQ ID NO:2 by amino acid substitutions, deletions and insertions, or combinations thereof at as many as 66% of the amino acid positions of SEQ ID NO:2. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, make and use the invention commensurate in scope with these claims.

Claims 1, 5, 6, 8-14, 16, 18 and 31-35 were not rejected for lack of utility because they embrace a subgenus of nucleic acid segments having nucleotide sequences isocoding with SEQ ID NO:1 herein, thus encode a native murine MURF-1 product which has the specific, substantial and demonstrable utility disclosed in the specification. But the scope of claims 1, 5, 6, 8-14, 16, 18 31-35 must be construed, according to Applicant's definition at page 3 of the specification, to embrace preparation of other nucleic acid segments that encode generic proteins wherein arbitrary assignments of any or all of amino acid substitutions, additions or deletions occur, e.g., in claim 31, in a protein that differs at as many as 66% of 296 amino acid positions within SEQ ID NO:2 from any array of 296 amino acid positions in SEQ ID NO:2, yet somehow retains a function. This rejection is stated because the specification cannot enable the making or the use of a multitude of nucleic acid segments having codon alterations within a nucleic acid segment of up to 888 nucleotides in length producing amino acid insertions, deletions, or substitutions anywhere, in any combination or any pattern, in the amino acid sequence set forth in SEQ ID NO:2. Neither Applicant's specification nor the prior art made of record with Applicant's Information Disclosure can identify 195 amino acids within any array of 296 amino acids in the primary sequence of the MURF-1 polypeptide depicted in SEQ ID NO:2 that might be altered, nor do they teach the nature of any alteration that might be made, which permits a resulting protein to function in microtubule stabilization or in intermediate filament stabilization. Mere sequence perturbation cannot support design and preparation of nucleotide sequences encoding a myriad of divergent proteins that retain a disclosed function. This is demonstrated by publications describing RING-B-box-Coiled-Coil [RBCC] proteins that share the structural organization of the murine MURF-1 disclosed herein, all

of which require the integrity of all three domains in their physiological functions mediating homodimer formation as well as association with heterologous proteins to form multimeric complexes. See, e.g., pages 1568-1570 of Cao et al., 1997, reference C7 made of record with Applicant's Information Disclosure Statement, Paper No. 10 filed January 2, 2002.

It is well settled that 35 U.S.C. §112, first paragraph, requires that a disclosure be sufficiently enabling to allow one of skill in the art to practice the invention as claimed without undue experimentation and that unpredictability in an attempt to practice a claimed invention is a significant factor supporting a rejection under 35 U.S.C. §112, first paragraph, for non-enablement. See, *In re Wands*, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988) (recognizing and applying the "*Forman*" factors). Cf., *Ex parte Forman*, 230 USPQ 546, 547 (Bd. Pat. App. & Int. 1986) (citing eight factors relevant to analysis of enablement). The standard set by the CCPA, the precursor of the Court of Appeals for the Federal Circuit, is not to "make and screen" any and all possible alterations because a reasonable correlation must exist between the scope asserted in the claimed subject matter and the scope of guidance the specification provides. *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 25 (CCPA 1970) (scope of enablement varies inversely with the degree of unpredictability of factors involved in physiological activity of small peptide hormone); see also, *Ex parte Maizel*, 27 USPQ2d 1662, 1665 (Bd. Pat. App. & Int. 1992) (functional equivalency of divergent gene products not supported by disclosure only of a single B-cell growth factor allele). The Federal Circuit approved the standard set by the CCPA in *Genentech, Inc. v. Novo-Nordisk A/S*, 42 USPQ2d 1001 (Fed. Cir. 1997).

The Federal Circuit has also considered whether definitional statements might enable a claim scope argued to extend beyond a disclosed gene product having its native amino acid sequence to embrace a specific variant gene product encoded by a specifically-altered DNA sequence. *Genentech, Inc. v. The Wellcome Found. Ltd.*, 29 F.3d 1555, 31

USPQ2d 1161 (Fed. Cir. 1994). The court held that only a narrow structural and functional definition was enabling precisely because the sweeping definitions of scope in the patent specification could not reasonably have been relied upon by the PTO in issuing the patent. *Genentech,* 29 F.3d 15 at 1564-65, 31 USPQ2d at 1168. Applying the "*Forman*" factors discussed in *Wands, supra,* to Applicant's disclosure, it is apparent that:

a) the specification lacks adequate, specific, guidance for altering nucleic acid sequence encoding the amino acid sequence of a murine MURF-1such as that depicted in SEQ ID NO:2 to the extent described in claim 31,

b) the specification lacks working examples wherein a nucleic acid sequence that encodes the amino acid sequence of a murine MURF-1such as that depicted in SEQ ID NO:2 is altered to the extent described in claim 31,

c) in view of the prior art publications of record herein, the state of the art and level of skill in the art do not support such alteration, and,

d) unpredictability exists in the art where no members of the class of RBCC proteins which comprises a murine MURF-1such as that depicted in SEQ ID NO:2 have had any particular amino acid positions specifically identified for individual modification for any purpose other than assessing residual capacities of altered RING and B-box domains to bind zinc ion.

Thus the scope of subject matters embraced by a generic MURF-1 protein as well as by the phrase, "that hybridizes to the nucleic acid segment of SEQ ID NO:1 . . . under standard hybridization conditions", are unsupported by the present specification even if taken in combination with teachings available in the prior art.

The following is a quotation of the second paragraph of 35 U.S.C. §112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6, 10, 11 and 33 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 is indefinite because it fails to distinctly describe any subject matter that differs from the subject matter of claim 5 from which it depends. Specifically, no MURF-1 coding region **within** the chromosomal DNA which, when the transcript is processed, will provide a contiguous coding region specifying the MURF-1 protein need contain a native promoter driving the transcription of MURF-1 gene, while at least one native promoter, which may be a promoter of claim 5, will "be positioned" **outside** of any coding region.

Claim 10 is indefinite in failing to distinctly describe a subject matter that differs from that described by the claim from which it depends, claim 9. This is because none of claims 1, 5 or 9 describe a vector. Instead, they describe a chromosome. Thus a DNA segment of claim 9 cannot, *a priori*, be a "vector" which claim 10 may then properly indicate to be a "viral vector". Claim 11 is indefinite because it contrarily requires that "a viral vector" of claim 10 somehow become "a non-viral vector". Claim 33 is indefinite because it defines a physiological impossibility where it requires a nucleic acid segment to be a viral vector even though the vector must meet the structural limitations of claim 31 from which it depends, i.e., "[a]n isolated nucleic acid segment of from 14 to about 888 nucleotides in length", and no viral genome of such limited size will function as a vector.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 19 and 26-32 are rejected under 35 U.S.C. §102(a) as being anticipated by Carninci et al., EMBL database Accession No. AV006036, published 25 August 1999 and made of record with Applicant's information disclosure of Paper No. 8.

Carninci et al. disclose the nucleotide sequence of a 461bp murine heart-derived cDNA sharing 96.5% sequence identity with SEQ ID NO:1 herein between positions 969 and 1431, inclusive, but encoding no portion of the RING of B-box domains and only a few amino acids of the coiled-coil domain. The murine cDNA of Carninci et al. comprises

a region of 318 contiguous nucleotides identical at all but one position to SEQ ID NO:1 herein in the 3'-coding and 3'-noncoding regions between positions 1114 and 1431, inclusive, meeting limitations of claims 19 and 26-31. Because Carninci et al. disclose that they maintained their cDNA in a cloning vector having an origin of replication, their publication meets limitations of claim 32 as well.

Claims 19 and 26-32 are rejected under 35 U.S.C. §102(a) as being anticipated by Konno et al., EMBL database Accession No. BB140247, published 28 June 2000, and made of record herewith.

Made of record herewith, Konno et al. disclose the nucleotide sequence of a 316bp murine bone-derived cDNA wherein a region of 159 contiguous nucleotides is identical to SEQ ID NO:1 herein at all but one position in the 3'-coding and 3'-noncoding regions of SEQ ID NO:1 herein between positions 1198 and 1356, inclusive, meeting limitations of claims 19 and 26-31. Because Konno et al. disclose that they maintained their cDNA in a cloning vector having an origin of replication, their publication meets limitations of claim 32 as well.

Claims, 1, 19 and 26-32 are rejected under 35 U.S.C. §102(b) as being anticipated by Lee et al., EMBL database Accession No. AA800245, published 30 April 1998 and made of record herewith.

Lee et al. disclose the nucleotide sequence of a 638bp rat heart-derived cDNA sharing 91.7% sequence identity with SEQ ID NO:1 herein between positions 783 and 1431, inclusive, encoding an amino acid sequence sharing 94% identity with the region of SEQ ID NO:2 herein from position 196 through 361, inclusive, representing the entire coiled-coil region and 17 amino acids amino-proximal thereto and the remainder of the carboxyl-proximal sequence of SEQ ID NO:2 save the final five amino acids. The rat heart-derived cDNA of Lee et al. meets the limitations of claim 1 because the specification clearly defines a DNA segment encoding a MURF-1 protein as originating in rats and further defines a MURF-1 protein functionally whereby the coiled-coil region of the rat MURF-1 protein encoded by the rat cDNA of Lee et al. is inherently capable of mediating its association with myocyte microtubules. The rat cDNA of Lee et al. also meets limitations

of claims 19 and 26-31 because it comprises a region of 65 contiguous nucleotides entirely identical to the internal coding region of SEQ ID NO:1 herein between positions 928 and 1046, inclusive, and because Lee et al. disclose that they maintained their cDNA in a cloning vector having an origin of replication, their publication meets limitations of claim 32 as well.

Claims 19, 26-29, 31, 32 and 34 are rejected under 35 U.S.C. §102(e) as being anticipated by Bednarik et al., WO 01/62767, made of record with Applicant's information disclosure of Paper No. 8, and which was published in English on an International Application filed 26 February 2001 based on priority document which is a U.S. provisional application filed 24 February 2000.

Bednarik et al. et al. disclose the nucleotide sequence of a 1990bp human myocardial cDNA wherein a region of 36 contiguous nucleotides is entirely identical to the internal coding region of SEQ ID NO:1 herein between positions 1099 and 1134, inclusive, meeting limitations of claims 19 and 26-29. Because Bednarik et al. disclose, page 11, that a DNA segment of their invention may comprise less than the entire coding region and that, pages 13, 14 and 21 a DNA segment of their invention may be maintained in a cloning vector having an origin of replication as well as in a viral vector, their publication meets limitations of claims 31, 32 and 34 as well.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 20-25 are rejected under 35 U.S.C. §103(a) as being unpatentable over any of Carninci et al., Konno et al., Lee et al., or Bednarik et al. as applied to claims 1 and 19 above, in view of either Walder et al., U.S. Patent No. 5,403,711 or Kamb et al., U.S. Patent No. 6,060,240.

The teachings of Carninci et al., Konno et al., Lee et al., or Bednarik et al. discussed above are taken as before. Walder et al. and Kamb et al. generally teach the preparation of systems for the practice of methods of detection of, respectively, the presence of, or the

relative amount of, expression of a gene represented by a mRNA transcript using one or more oligonucleotides of between 15 and 50 nucleotides in length corresponding to coding regions of the transcribed gene. It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare a system for the practice of either of the methods of detection of either Walder et al. or Kamb et al. by using a nucleic acid segment of a cDNA of Carninci et al., Konno et al., Lee et al., or Bednarik et al. in order to detect the presence of, or the relative amount of, expression of a gene represented by a mRNA transcript in murine bone, murine heart, rat heart or human heart taught by Carninci et al., Konno et al., Lee et al., or Bednarik et al. This is because such an artisan would have found in the teachings of Walder et al. or Kamb et al. adequate instruction for the use of any portion of a cDNA of Carninci et al., Konno et al., Lee et al., or Bednarik et al. in such a method and would have experienced motivation to do so to detect the presence or the relative amount of expression of a corresponding mRNA transcript in cells of such mammalian tissues in order to determine the physiological response of these tissues to developmental, proliferative, or physiological stimuli.

Claims 33 is rejected under 35 U.S.C. §103(a) as being unpatentable over Lee et al. and Bednarik et al. as applied to claims 31 and 32 above, in view of Moore et al., U.S. Patent No. 6,248,724, made of record herewith.

The teachings of Lee et al. and Bednarik et al. discussed above are taken as before. Moore et al. teach, cols. 41-42, that adenoviral vectors may be used to convey expression systems permitting expression of the complement of a portion of a coding sequence specifying a mammalian polypeptide in a cell which is a target of the virus in order to disrupt the expression of the polypeptide by the cell. It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare an adenoviral vector to convey an expression system permitting expression of the complement of a portion of a coding sequence specifying the coiled-coil polypeptide of Lee et al., or the myocardial polypeptide of Bednarik et al., in order to disrupt the expression of either of

these polypeptides in, respectively, rat heart cells, or human myocardial cells. This is because such an artisan would have found in the teachings of Moore et al. adequate instruction for the preparation of an adenoviral vector permitting expression of the complement of any portion of a nucleic acid complement of a coding region specifying the cardiac coiled-coil polypeptide of Lee et al., or the myocardial polypeptide of Bednarik et al., and would have experienced motivation to do so to inhibit the expression of either encoded polypeptide in such cells in order to determine the physiological response thereto where Lee et al. teach that their cDNA represents a transcript present in rat heart and Bednarik et al. teach that their cDNA represents a transcript present in human heart in a state of physiological stress.

Claims 35 is rejected under 35 U.S.C. §103(a) as being unpatentable over Lee et al. and Bednarik et al. as applied to claims 31 and 32 above, in view of Love et al., U.S. Patent No. 6,096,720, made of record herewith.

The teachings of Lee et al. and Bednarik et al. discussed above are taken as before. Love et al. generally teach the encapsulation of a portion of a nucleic acid complement of a coding region specifying a mammalian polypeptide in liposomes to prepare a composition capable of conveying the oligonucleotide comprising the nucleic acid complement of a coding region to cells. It would have been obvious to one of ordinary skill in the art at the time the invention was made to encapsulate a portion of a nucleic acid complement of a coding region specifying the coiled-coil polypeptide of Lee et al., or the myocardial polypeptide of Bednarik et al., in liposomes in order to prepare a composition capable of conveying the oligonucleotide comprising the nucleic acid complement of a coding region to, respectively rat bone cells, or human myocardial cells. This is because such an artisan would have found in the teachings of Love et al. adequate instruction for the use of any portion of a nucleic acid complement of a coding region specifying the cardiac coiled-coil polypeptide of Lee et al., or the myocardial polypeptide of Bednarik et al., and would have experienced motivation to do so to inhibit the expression of either encoded polypeptide in

such cells in order to determine the physiological condition resulting therefrom where Lee et al., teach that their cDNA represents a transcript present in rat heart and Bednarik et al. teach that their cDNA represents a transcript present in human heart muscle in a state of response to physiological stress.

Allowable Subject Matter

Claims 4, 15 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. It is noted that amending claims 1, 6, 10, 11 in such a fashion as to overcome the rejections stated above under 35 U.S.C. §§101, 102(b), and 112, second paragraph, and that further amending claims 1, 12 and 18 to incorporate limitations of claim 2 and 15 – together with the cancellation of claims 2 and 15 which would become redundant – in order to avoid the rejections stated above under 35 U.S.C. §112, first paragraph, would permit allowance of a set of claims to Applicant's elected subject matter: an isolated DNA segment comprising a region encoding a murine MURF-1 protein, and vectors and transformed host cells comprising same, as well as a recombinant method of producing an encoded murine MURF-1 protein using a host cell transformed with a polynucleotide comprising a segment encoding a murine MURF-1.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William W. Moore whose telephone number is 703.308.0583. The examiner can normally be reached between 9:00AM-5:30PM EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura Achutamurthy can be reached at 703.308.3804. Further fax phone numbers for the organization where this application or proceeding is assigned are 703.308.4242 for regular communications and 703.308.0294 for After Final communications. The examiner's direct FAX telephone number is 703.746.3169. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0196.

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January 22, 2003

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